

COMBUSTION AND FLAME

THE JOURNAL OF THE COMBUSTION INSTITUTE

VOLUME 88

VOLUME 88

NUMBER 1

JANUARY 1992

Contents

LARRY L. BAXTER and REGINALD E. MITCHELL (Livermore, CA) The Release of Iron During the Combustion of Illinois No. 6 Coal	1
C. A. CATLIN and D. M. JOHNSON (Solihull, U. K.) Experimental Scaling of the Flame Acceleration Phase of an Explosion by Changing Fuel Gas Reactivity	15
G. GOYAL, P. J. PAUL, and H. S. MUKUNDA (Bangalore, India) Computational Studies on One-Dimensional Laminar, Premixed Hydrogen-Nitric Oxide Flames	28
JAMES F. DRISCOLL, RUEY-HUNG CHEN, and YOUNGBIN YOON (Ann Arbor, MI) Nitric Oxide Levels of Turbulent Jet Diffusion Flames: Effects of Residence Time and Damkohler Number	37
S. AU, R. HALEY, and P. R. SMY (Edmonton, Canada) The Influence of Igniter-Induced Blast Wave Upon the Initial Volume and Expansion of the Flame Kernel	50
FRANK G. SMITH III, RANIE W. PENDARVIS (Aiken, SC), and RICHARD W. RICE (Clemson, SC) Combustion of Cellulosic Char Under Laminar Flow Conditions	61
ÖMER L. GÜLDER (Ottawa, Canada) Soot Formation in Laminar Diffusion Flames at Elevated Temperatures	74
D. G. TALLEY (Edwards AFB, CA) Universal Definitions of Mixture Fractions and Progress Variables for Arbitrary States of Premixing	83
J. THOMAS MCKINNON, WILLIAM L. BELL (Wheat Ridge, CO) and ROBERT M. BARKLEY (Boulder, CO) Combustion Synthesis of Fullerenes	102
V. I. ROZENBAND and N. I. VAGANOVA (Chernogolovka, USSR) A Strength Model of Heterogeneous Ignition of Metal Particles	113
Comment	
RICK RAUENZAHN (Los Alamos, NM) Comment on "Pressure-containing Correlations in Variable Density and Turbulent Reacting Flows," by P. H. Gaskell and A. K. C. Lau	119

Contents

S. H. CHAN and C. C. TAN (Milwaukee, WI) Complex Equilibrium Calculations by Simplex and Duality Theories with Applications to Liquid Metal Fuel Propulsion Systems.....	123
DWAYNE E. HEARD, JAY B. JEFFRIES, GREGORY P. SMITH, and DAVID R. CROSLEY (Menlo Park, CA) LIF Measurements in Methane/Air Flames of Radicals Important in Prompt-NO Formation	137
F. BAILLOT, D. DUROX, and R. PRUD'HOMME (Meudon, France) Experimental and Theoretical Study of a Premixed Vibrating Flame	149
PETER H. CRIBB (North York, Canada), JOHN E. DOVE (Toronto, Canada), and SATOSHI YAMAZAKI (Aichi-Ken, Japan) A Kinetic Study of the Pyrolysis of Methanol Using Shock Tube and Computer Simulation Techniques	169
PETER H. CRIBB (North York, Canada), JOHN E. DOVE (Toronto, Canada), and SATOSHI YAMAZAKI (Aichi-Ken, Japan) A Kinetic Study of the Oxidation of Methanol Using Shock Tube and Computer Simulation Techniques	186
M. GONZALES, R. BORGHI, and A. SAOUAB (Mont-Saint-Aignan, France) Interaction of a Flame Front with Its Self-Generated Flow in an Enclosure: The "Tulip Flame" Phenomenon	201
S. KWON, M. -S. WU, J. F. DRISCOLL, and G. M. FAETH (Ann Arbor, MI) Flame Surface Properties of Premixed Flames in Isotropic Turbulence: Measurements and Numerical Simulations	221

Contents

U. MAAS (Stuttgart, Germany) and S. B. POPE (Ithaca, NY) Simplifying Chemical Kinetics: Intrinsic Low-Dimensional Manifolds in Composition Space.....	239
WEN-PIN HO, ROBERT B. BARAT, and JOSEPH W. BOZZELLI (Newark, NJ) Thermal Reactions of CH_2Cl_2 in H_2/O_2 Mixtures: Implications for Chlorine Inhibition of CO Conversion to CO_2	265
D. STEPOWSKI and G. CABOT (Mont Saint Aignan, France) Single-Shot Temperature and Mixture Fraction Profiles by Rayleigh Scattering in the Development Zone of a Turbulent Diffusion Flame	296
THEODORE A. STEINBERG, DONALD B. WILSON, and FRANK BENZ (Las Cruces, NM) The Burning of Metals and Alloys in Microgravity	309
AHMAD R. SHOUMAN and SAAD EL-SAYED (Las Cruces, NM) Accounting for Reactant Consumption in the Thermal Explosion Problem. Part I: Mathematical Foundation	321
TAKASHI KASHIWAGI and HIDESABURO NAMBU (Gaithersburg, MD) Global Kinetic Constants for Thermal Oxidative Degradation of a Cellulosic Paper	345
STEWART K. GRIFFITHS (Livermore, CA) and ROBERT H. NILSON (LaJolla, CA) Similarity Analysis of Fracture Growth and Flame Spread in Deformable Solid Propellants	369
B. JAWAD, E. GULARI, and N. A. HENEIN (Detroit, MI) Characteristics of Intermittent Fuel Sprays	384
J.-Y. CHEN (Livermore, CA) and W. KOLLMANN (Davis, CA) PDF Modeling and Analysis of Thermal NO Formation in Turbulent Nonpremixed Hydrogen-Air Jet Flames	397
WEI BIAO FU and TAO FENG ZENG (Beijing, China) A General Method for Determining Chemical Kinetic Parameters During Ignition of Coal Char Particles	413
E. Ya. SHAFIROVICH and U. I. GOLDSHLEGER (Moscow, Russia) The Superheat Phenomenon in the Combustion of Magnesium Particles	425
HONG-TU FENG, C. J. HILDYARD, and S. K. SCOTT (Leeds, U. K.) Thermal Runaway in a System with a Constant Power Source	433